We claim:

1. A potassium channel comprising a voltage-gated potassium channel which when expressed in a mutant yeast deficient in potassium uptake allows the mutant yeast to grow in the presence of media with very low potassium concentration, wherein said voltage-gated potassium channel comprises one or more mutations which produces a constitutively open voltage-gated potassium channel.

2. The potassium channel of claim 1, wherein the very low potassium concentration is about 2 mM or less.

3. The potassium channel of claim 1, wherein the very low potassium concentration is about 1 mM or less.

4. The potassium channel of claim 1, wherein the very low potassium concentration is about 0.7 mM or less.

5. The potassium channel of claim 1, wherein the very low potassium concentration is about 0.5 mM or less.

6. The potassium channel of claim 1, wherein the very low potassium concentration is about 0.2 mM or less.

7. The potassium channel of claim 1, wherein the mutant yeast lacks TRK1 or TRK1 and TRK2 potassium transporter activity.

8. The potassium channel of claim 7, wherein the mutant yeast lacks TRK1 and TRK2 potassium transporter activity.

9. The potassium channel of claim 1, wherein the mutations in the voltage-gated potassium channel are homologous to R400Q, and P513D in Kv1.5.

10. The potassium channel of claim 1, wherein the mutations in the voltage-gated potassium channel are homologous to R403Q, and P513D in Kv1.5.

11. The potassium channel of claim 1, wherein the mutations in the voltage-gated potassium channel are homologous to R409Q, and P513D in Kv1.5.

12. The potassium channel of claim 1, wherein the mutations in the voltage-gated potassium channel are homologous to R400Q, R403Q, and P513D in Kv1.5.

13. The potassium channel of claim 1, wherein the mutations in the voltage-gated potassium channel are homologous to R400Q, R409Q, and P513D in Kv1.5.

14. The potassium channel of claim 1, wherein the mutations in the voltage-gated potassium channel are homologous to R403Q, R409Q, and P513D in Kv1.5.

15. The potassium channel of claim 1, wherein the mutations in the voltage-gated potassium channel are homologous to R400Q, R403Q, R409Q, and P513D in Kv1.5.

16. The potassium channel of claim 1 or 7, wherein the voltage-gated potassium channel is a member of an ion channel family comprising Kv10, Kv11, and Kv12.

17. The potassium channel of claim 1 or 7, wherein the voltage-gated potassium channel is a member of the Kv10 ion channel family.

18. The potassium channel of claim 1 or 7, wherein the voltage-gated potassium channel is a member of the Kv11 ion channel family.

19. The potassium channel of claim 1 or 7, wherein the voltage-gated potassium channel is a member of the Kv12 ion channel family.

20. The potassium channel of claim 1 or 7, wherein the voltage-gated potassium channel is a member of an ion channel family comprising Kv1, Kv2, Kv3, and Kv4.

21. The potassium channel of claim 1 or 7, wherein the voltage-gated potassium channel is a member of the Kv1 ion channel family.

22. The potassium channel of claim 1 or 7, wherein the voltage-gated potassium channel is a member of the Kv2 ion channel family.

23. The potassium channel of claim 1 or 7, wherein the voltage-gated potassium channel is a member of the Kv3 ion channel family.

24. The potassium channel of claim 1 or 7, wherein the voltage-gated potassium channel is a member of the Kv4 ion channel family.

25. The potassium channel of claim 1 or 7, wherein the voltage-gated potassium channel is Kv1.5 or hERG.

26. The potassium channel of claim 1 or 7, wherein the voltage-gated potassium channel is Kv1.5

27. The potassium channel of claim 1 or 7, wherein the voltage-gated potassium channel is hERG.

28. A yeast cell comprising a deficiency in potassium uptake and a constitutively open voltage-gated potassium channel which allows said yeast cell to grow in the presence of media with very low potassium.

29. The yeast cell of claim 28, wherein the deficiency is due to a lack of TRK1 or TRK1 and TRK 2 potassium transporter activity.

30. The yeast cell of claim 28, wherein the deficiency is due to a lack of TRK1 and TRK 2 potassium transporter activity.

31. The yeast cell of claim 28 or 29, wherein the very low potassium concentration is about 2 mM or less.

32. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel comprises one or more mutations that are homologous to R400Q, R403Q, R409Q, or P513D in Kv1.5.

33. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel comprises two or more mutations that are homologous to R400Q, R403Q, R409Q, or P513D in Kv1.5.

34. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel comprises mutations homologous to R400Q, and P513D in Kv1.5.

35. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel comprises mutations homologous to R403Q, and P513D in Kv1.5.

36. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel comprises mutations homologous to R409Q, and P513D in Kv1.5.

37. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel comprises mutations homologous to R400Q, R403Q, and P513D in Kv1.5.

38. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel comprises mutations homologous to R400Q, R409Q, and P513D in Kv1.5.

39. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel comprises mutations homologous to R403Q, R409Q, and P513D in Kv1.5.

40. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel comprises mutations homologous to R400Q, R403Q, R409Q, and P513D in Kv1.5.

41. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel is a member of an ion channel family comprising Kv10, Kv11, and Kv12.

42. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel is a member of the Kv10 ion channel family.

43. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel is a member of the Kv11 ion channel family.

44. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel is a member of the Kv12 ion channel family.

45. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel is a member of an ion channel family comprising Kv1, Kv2, Kv3, and Kv4.

46. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel is a member of the Kv1 ion channel family.

47. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel is a member of the Kv2 ion channel family.

48. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel is a member of the Kv3 ion channel family.

49. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel is a member of the Kv4 ion channel family.

50. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel is Kv1.5 or hERG.

51. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel is Kv1.5.

52. The yeast cell of claim 28 or 29, wherein the constitutively open voltage-gated potassium channel is hERG.

53. A recombinant nucleic acid molecule comprising a nucleic acid sequence encoding the potassium channel of claim 1.

54. A recombinant nucleic acid molecule comprising a promoter sequence operably linked to the nucleic acid molecule of Claim 53.

55. A method comprising:

(a) providing a cell deficient in potassium uptake expressing the potassium channel of claim 1, wherein said cell has a high negative potential across the plasma membrane;

(b) growing the cell in very low potassium;

(c) adding a compound; and

(d) assaying the effect of the compound on the growth of the cell.

56. The method of claim 55, wherein the cell is a yeast cell.

57. The method of claim 56, wherein the yeast cell lacks TRK1 or TRK1 and TRK2 transporter activity.

58. The method of claim 56, wherein the yeast cell lacks TRK1 and TRK2 transporter activity.

59. The method of claim 57, wherein the yeast cell is S. cerevisiea.

60. The method of claim 55, wherein assaying the effect of the compound on the growth of the cell represents a procedure to determine the modulating activity of said compound on the potassium channel of claim 1.

61. The method of claim 60, wherein the modulating activity refers to the inhibition activity of said compound on the potassium channel of claim 1.